

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
24 June 2004 (24.06.2004)

PCT

(10) International Publication Number  
**WO 2004/054013 A3**

(51) International Patent Classification<sup>7</sup>: **C01B 3/38**,  
3/48, 3/58

(21) International Application Number:  
PCT/US2003/023759

(22) International Filing Date: 30 July 2003 (30.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/209,486 30 July 2002 (30.07.2002) US  
60/484,086 1 July 2003 (01.07.2003) US

(71) Applicant: UOP LLC [US/US]; 25 East Algonquin Road,  
Des Plaines, IL 60017-5017 (US).

(71) Applicants and

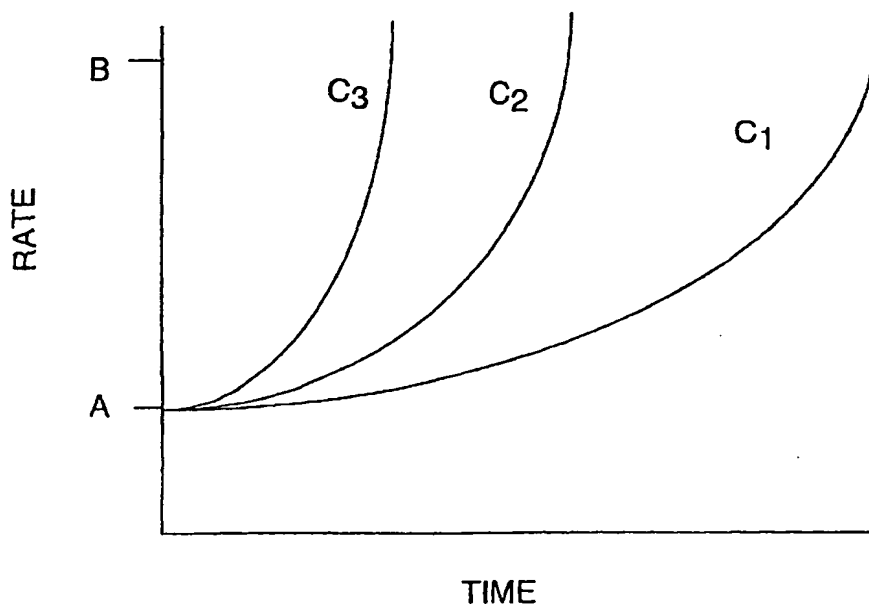
(72) Inventors: **RUSSELL, Bradley, P.** [US/US]; UOP LLC,  
25 East Algonquin Road, Des Plaines, IL 60017-5017  
(US). **HARNES, John, R.** [US/US]; UOP LLC, 25  
East Algonquin Road, Des Plaines, IL 60017-5017 (US).  
**BLOMMEL, Paul, G.** [US/US]; UOP LLC, 25 East  
Algonquin Road, Des Plaines, IL 60017-5017 (US).  
**SIOU, Daniel, R.** [US/US]; UOP LLC, 25 East Algo-  
nquin Road, Des Plaines, IL 60017-5017 (US). **ABDO,**  
**Suheil, F.** [US/US]; UOP LLC, 25 East Algonquin Road,  
Des Plaines, IL 60017-5017 (US). **VANDEN BUSSCHE,**  
**Kurt, M.** [BE/US]; UOP LLC, 25 East Algonquin Road,  
Des Plaines, IL 60017-5017 (US). **SANGER, Robert,**  
**J.** [US/US]; UOP LLC, 25 East Algonquin Road, Des  
Plaines, IL 60017-5017 (US).

(74) Common Representative: **TOLOMEI, John, G.**; UOP  
LLC, Asst. Secretary-Patent Matters, 25 East Algonquin  
Road, Des Plaines, IL 60017-5017 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,

[Continued on next page]

(54) Title: FEEDFORWARD CONTROL PROCESSES FOR VARIABLE OUTPUT HYDROGEN GENERATORS



(57) Abstract: Hydrogen generators and integrated hydrogen generator/fuel cells systems are operated by determining the condition of the hydrogen generator and the condition of the fuel to the hydrogen generator for selection of predetermined flow rates for each of the externally-provided raw materials. The processes of the invention can provide rapid transitions between hydrogen production rates while enabling enhanced efficiency and stability during transient operations.